

Modular Power System Configured with Standard Product Hybrid DC-DC Converters, Phase I

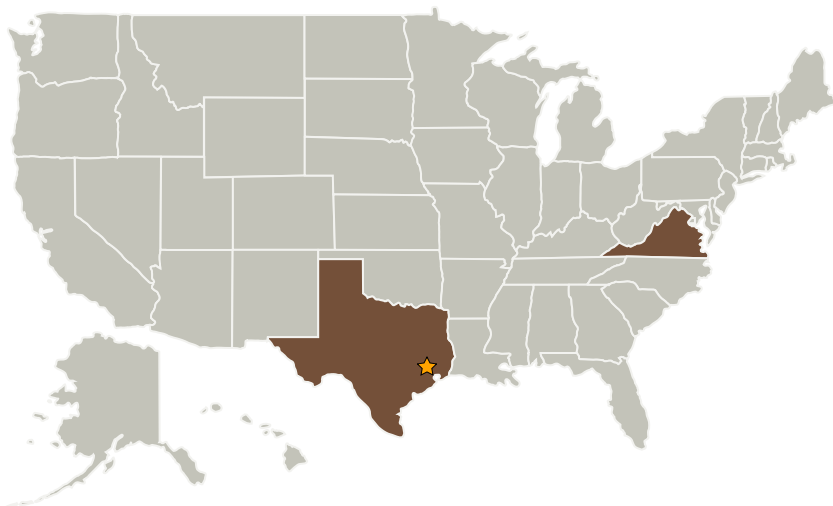
Completed Technology Project (2005 - 2005)



Project Introduction

VPT proposes an innovative concept whereby complex, multiple-output, DC-DC converter systems can be configured through use of only 2 standard product hybrid DC-DC Converter modules. The key module attributes that make this feasible are: programmable output, parallel current-sharing capability, synchronization capability, dual (plus and minus) output voltage, 500V input-output-case isolation, external shutdown, total dose and single event effects radiation hardening, and ability to be element evaluated, screened, and qualified to MIL PRF 38534 Class K (space flight) standards. Once these attributes are satisfied, it is shown that highly complex systems can be designed and delivered with a minimum of nonrecurring engineering. This includes 28V or 100V input systems, low voltage and higher voltage outputs, and highly varying output power. The system allows output series operation for increased output voltage, as well as input series operation to accommodate increased input voltages. This is all accomplished without the need of a centralized controller. This confines most of the common failure modes to graceful degradation as opposed to catastrophic shut down. In Phase I, it is demonstrated that a complex, multiple output system, 100Vin, 1KW system is configured with multiple 100W, 28V input modules.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission
Directorate (STMD)

Lead Center / Facility:

Johnson Space Center (JSC)

Responsible Program:

Small Business Innovation
Research/Small Business Tech
Transfer

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Organizations Performing Work	Role	Type	Location
★ Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
VPT, Inc.	Supporting Organization	Industry	Blacksburg, Virginia

Primary U.S. Work Locations

Texas	Virginia
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Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Dan Sable

Technology Areas

Primary:

- TX03 Aerospace Power and Energy Storage
 - └ TX03.3 Power Management and Distribution
 - └ TX03.3.3 Electrical Power Conversion and Regulation